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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/506,363	09/02/2004	Masanori Yoshikawa	10873.1517USWO	1043
7590 03/22/2006 HAMRE, SCHUMANN, MUELLER & LARSON, P.C. P.O. BOX 2902-0902 MINNEAPOLIS, MN 55402-0902			EXAMINER KHATRI, PRANAV V	
			ART UNIT 2872	PAPER NUMBER

DATE MAILED: 03/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/506,363

Applicant(s)

YOSHIKAWA ET AL.

Examiner

Pranav V. Khatri

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 December 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 7-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 5 and 6 is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 September 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

The amendments to Claims 1-11 in the submission dated 12/29/2005 are acknowledged and accepted. Applicant alleges claim 7 should have been included in the rejection 10/03/2005. Nevertheless, claim 7 was rejected on page 3 of the office action mailed on 10/03/2005.

### ***Claim Objections***

Claim 8 has vague, indefinite and/or unclear language. The term "space" is defined by the 3 beams which form the boundaries of the space. The term "Interposed"" seems to be inappropriately used in this instance, since the term means "between" and would require only two boundaries. The claims should be revised carefully in order to avoid claim objections.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4 and 9-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Atsumi (US Patent No. 6,198,563).

Regarding claim 1, Atsumi discloses an optical scanner (figure 20), comprising: a light source part (figure 19); and optical deflector (4) that scans a light beam from the light source part; and first (60') and second (50') reflecting optical elements, wherein the

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light beam from the light source part (1), after being reflected from the optical deflector (4), is reflected from the second reflecting (50') optical element, then is reflected from the first reflecting optical element (60'), and further is reflected from the second reflecting optical element (50', as seen in figure 20).

Regarding claim 2, Atsuumi discloses further comprising: and a first image forming optical system (figure 19, numeral 2 and 3) that is disposed between the light source part (1) and the optical deflector (4) and allows a linear image to be formed on a deflection surface of the optical deflector (Col 11, lines 60-65), wherein the first reflecting optical element (60') is formed of a curved surface mirror (60' is a cylindrical mirror, fig 20), and is disposed between the optical deflector (4) and a surface (8) to be scanned and constitutes a second image forming optical system, and the first image forming optical system, the optical deflector (4), and the second image forming optical system are disposed respectively in different positions in a sub-scanning direction so that a light beam from the first image forming optical system (figure 19, numeral 2 and 3) is incident obliquely relative to a plane that includes a normal line to the deflection surface of the optical deflector (4) and is parallel to a main scanning direction (Fig 19 and 20), and so that a light beam from the optical deflector is incident obliquely relative to a plane that includes a normal line at a vertex of the curved surface mirror (50) and is parallel to the main scanning direction (hereinafter, referred to as a "YZ plane") (fig 19 and 20).

Regarding claim 3, Atsuumi discloses wherein the first reflecting optical element (60') is formed of a curved surface mirror (60' is a cylindrical mirror, and is curved as

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seen in figure 20), and the curved surface mirror (60') has a shape symmetrical with respect to a plane that includes a normal line at a vertex of the curved surface mirror and is perpendicular to a main scanning direction (hereinafter, referred to as an "XZ plane") (figure 20).

Regarding claim 4, Atsuumi discloses wherein the second reflecting optical element (50') reflects a light beam reflected from the optical deflector (4) and a light beam reflected from the first reflecting optical element (60') by using a common surface of the second reflecting optical element (reflected on one surface of mirror 50').

Regarding claim 9, Atsuumi discloses wherein the first reflecting optical element (60' is a cylindrical mirror) has a shape that permits compensation for a curve of a scanning line that occurs due to oblique light incidence (Col 11 line 66 – Col 12 line 4, and Col 12 lines 50-55).

Regarding claim 10, Atsuumi discloses wherein the curved surface mirror (60') has a skew shape (fig 20) in which a normal line at each of points other than the vertex on a generatrix that is a curved line where a surface of the curved surface mirror intersects with the YZ plane is not included in the YZ plane (fig 20).

Regarding claim 11, Atsuumi discloses an image forming apparatus comprising an optical scanner as claimed in claim 1 (see background, Col 1 lines 14-16).

Claims 1 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Atsuumi (US Patent No. 6,198,563) (another embodiment).

Regarding claim 1, Atsuumi discloses an optical scanner (figure 17), comprising: a light source part (1); and optical deflector (4) that scans a light beam from the light

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source part (1); and first (100 with reflection portion 90') and second (70) reflecting optical elements, wherein the light beam from the light source part (1), after being reflected from the optical deflector (4), is reflected from the second reflecting (70) optical element, then is reflected from the first reflecting optical element (100 with reflection portion 90'), and further is reflected from the second reflecting optical element (70, as seen in figure 17, the second reflection off mirror 70 is sent through the transparent window 100 ).

Regarding claim 7, Atsumi discloses wherein the first reflecting optical element (100 with reflection portion 90') is disposed in a space interposed between a light beam reflected from the optical deflector (4) to be incident on the second reflecting optical element (70) and a light beam reflected last from the second reflecting optical element (70, the last reflection is off mirror 70, and the reflection is sent through the transparent window 100).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Atsumi (US Patent No. 6,198,563).

Regarding claim 8, Atsuumi discloses the claimed invention as set forth above except does not teach a third reflecting optical element that reflects a light beam reflected last light from the second reflecting optical element, wherein the first reflecting optical element is disposed in a space interposed among a light beam reflected from the optical deflector to be incident on the second reflecting optical element, the light beam reflected last from the second reflecting optical element to be incident on the third reflecting optical element, and a light beam reflected from the third reflecting optical element. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the invention of Atsuumi to have a redirecting mirror or third mirror for the purpose of the design structure. Furthermore, it is known that a redirecting mirror is used for allowing a more compact scanning design. The mirror allows the beam to redirected to a position of the photoreceptor, and the photoreceptor may be positioned so that a compact scanning device is made.

***Allowable Subject Matter***

Claims 5 and 6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: claims are allowable at least for the reason that the prior art does not teach or reasonably suggest the following conditional expressions (1), (2), and (3):

$$dm/2 + 1 \leq 21 \tan \Theta M \leq dl/2 + do/2 + 2 \quad (1);$$

$$di = dm \times (L - Lmi) / L \quad (2);$$

$$do = dm \times (D - Lmo) / D \quad (3).$$

Atsuumi discloses all as set forth in the claims except the above conditional expressions.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-4 and 7-11 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.



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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pranav V. Khatri whose telephone number is 571-272-8311. The examiner can normally be reached on M-F, 8:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Pranav Khatri  
Examiner  
03/09/2006



**DREW A. DUNN**  
**SUPERVISORY PATENT EXAMINER**